INTEGRAL MACA AGROINDUSTRIAL

PROJECT

Executive Summary

In order to support the implementation of a Fruit Production Project that meets international quality standards, an execution agreement is proposed, which includes:

- **Productive Development**: Production and industrialization of *maca* in the Central Highlands.
- **Solving Agricultural Waste**: By industrializing maca into high-value-added products, losses will be avoided.
- **Adding Value**: Obtain products that significantly exceed the value of non-industrialized ones.
- **Commercialization**: Establish a commercial network for the processed products.
- **Training**: Technical training in collection, processing, and business management.

The total cost of the project is six million one hundred twenty-five thousand six hundred seventy-three dollars ($6,125,673), which covers the points mentioned above.

For working capital, it will be necessary to cover the costs of approximately 60 employees, basic services, and connectivity. Additionally, maintenance and logistics controls are included in the budget.

LOCATION

This project will be located at the Angaguana, from Ambato, Province of Tungurahua.

JUSTIFICATION

Maca is a species that has developed exclusively in the Andean páramo. It thrives at altitudes between 3,800 and 4,450 meters above sea level, where low temperatures and strong winds are limiting factors for other plant species. It is a crop that endures very adverse conditions, such as the climate (3,900 to 4,500 meters above sea level), where other crops fail to prosper.

Maca contributes significantly to improving the diet of both rural and urban populations. It has great nutritional value, surpassing other roots and tubers due to its content of carbohydrates, minerals (Ca, P, Fe), and vitamins. Due to its high caloric content, it acts as a restorative for endocrine glands, including the thyroid.

Maca is a highly adaptable crop. It has low production costs and offers excellent profitability. Additionally, maca contains a significant amount of essential amino acids and has higher levels of iron and calcium than white potatoes.

Targeting a different state policy, the commercialization and export of national products, such as maca, to consumer markets in the region and other parts of the world would be highly beneficial.

OBJECTIVES

General Objective:

The general objective is the introduction of Maca, *Lepidium meyenii* Walp, a crop capable of growing in páramo ecosystems. Its production is in high demand as it can be industrialized into flour, which serves as a nutritional supplement, fortifier, and revitalizer for both human and animal consumption. This is an innovative solution, particularly for the highlands of the Central Sierra Region, where maca can ecologically thrive in páramo conditions, primarily above 3,500 meters above sea level.

The project's results will first be transferred at the primary production level among farmers in various areas of the highlands. Secondly, the final product, maca flour, will be distributed for use in the poultry industry and in the production of goldenberries.

Specific Objectives:

- Develop a transferable technological package for Maca to facilitate its adoption by farmers.
- Develop the production of base seeds for the expansion of Maca cultivation.
- Develop and evaluate the use of Maca flour as an ingredient for feeding or supplementing the diet of poultry and fish.
- Technically and economically evaluate the developed technological package.
- Determine the cost and selling price of the product.

INVESTMENT

The investment required for the physical implementation of the plant is as follows:

AÑO	PRESUPUESTO
0	5.325.000
1	550.000*
2	250.673*
Total	$ 6,125,673

*The amounts for Years 1 and 2 represent reinvestments to optimize production and the plant's capacity.

PROJECT COMPONENTS

COMPONENTE	PRESUPUESTO
Inversiones Previas y AFN	193.000
Terreno	150.000
Construcción	355.000
Equipamiento	1.481.122
Capital Inicial de trabajo	3.379.699
Imprevistos	566.852
Total	**$ 6.155.673**

BENEFITS

The economic benefits are reflected in the financial projection calculated over 10 years, showing the following indicators:

- **Internal Rate of Return (IRR)**: 55.4% over a 20-year period.
- **Net Present Value (NPV)**: The Net Present Value, calculated at a discount rate of 12%, demonstrates that the initiative is economically profitable, reaching $51,781,872.
- **Return on Investment (ROI)**:
- **Payback Period (PRI)**: The investment will be recovered within the first 5 years of plant operation, with a payback period of 4 years.
- **Total Investment**: $6,125,673

Additionally, this project will create at least 8,000 direct jobs and over 2,000 indirect jobs.